



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200
Fax 613 632-5246

D350-748-203
Job Sheet 181668



Part No: D350-748-203

Job Qty: 1 ea

Part Name: AS350 / AS355 Stainless Steel Aft Crosstube



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 8/3/18

Job Tracking No:

Due Date: 8/24/18

Created By: Marie Lajeunesse

Type: Stock

Description:

Note: D350-748-243 REV:A IPP REV:A 15.03.23 NEW ISSUE DD VERF;JLM

Ship Via:

0931

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier	Sign-off
					Setup Hrs	Run Hrs		
90	Start up Operation	1 Ea	8/24/18	8/24/18	0.00	0.00	Start Up Crosstubes-1	
110	CNC Bend Crosstubes	1 pcs	8/24/18	8/24/18	5.40	2.44	CNC Bend Crosstube	
120	Crosstubes	1 pcs	8/24/18	8/24/18	0.00	2.19	Crosstubes-2	
127	QC	1 pcs	8/24/18	8/24/18	0.00	0.00	QC15	
128	Crosstubes	1 pcs	8/24/18	8/24/18	0.00	1.98	Crosstubes-2	
130	Crosstubes	1 pcs	8/24/18	8/24/18	0.00	2.89	Crosstubes-2	
140	QC	1 pcs	8/24/18	8/24/18	0.00	0.00	QC6	
174	Outsource	1 pcs	8/24/18	8/24/18			SKY002-VC	
176	Packaging	1 pcs	8/24/18	8/24/18	0.00	0.00	Packaging2	
178	QC	1 pcs	8/24/18	8/24/18	0.00	0.00	QC5	
180	SprayPaint	1 pcs	8/24/18	8/24/18	0.00	1.07	Spray Paint	
190	QC	1 pcs	8/24/18	8/24/18	0.00	0.00	QC14	
193	Outsource - 11 - Paint	1 pcs	8/24/18	8/24/18			ATE003-VC	5
195	Packaging 2-1 - Receive - B4B	1 pcs	8/24/18	8/24/18	0.00	0.00	Packaging 2 - 1 - B4B	
197	QC 6	1 pcs	8/24/18	8/24/18	0.00	0.00	QC 6 - 16	
200	Crosstubes	1 pcs	8/24/18	8/24/18	0.00	2.89	Crosstubes-2	
210	QC	1 pcs	8/24/18	8/24/18	0.00	0.00	QC5	
220	Packaging	1 pcs	8/24/18	8/24/18	0.00	0.00	Packaging1-3	
230	QC	1 pcs	8/24/18	8/24/18	0.00	0.00	QC4	
240	Packaging	1 pcs	8/24/18	8/24/18	0.00	0.00	Packaging3-1	
245	DC	1 pcs	8/24/18	8/24/18	0.00	0.00	DC	
250	QC21-FG	1 Ea	8/24/18	8/24/18	0.00	0.00	QC21	

Part Op 110 - Bend tube as per Dwg D350-748-243 using CNC bender program D350A and Folio FT
 Descriptions: .225" PER SIDE*****USE (4) DT9824 SHIM BLOC TO CHECK STRAIGHTNESS*****

120 - ****VERIFY CROSSTUBE DIMENSIONS AS PER DWG****

127 - ***MARK CUT LINES***

128 - CUT TUBE AT HEIGHT ON FAI SHEET VERF HEIGHT _____ BY QC 15 LEVEL INSPECTOR _____

130 - 1- Drill Tube as per Dwg D350-748-243 Using DT8876 Drill Jigs, set-up drill table as per QSI 010. 2-Deburr 3- Engrave Part # and Batch # as per Dwg D350-748-243 4- Remove all marks from tube within limits of D350-748-243

174 - ISSUE P/O TO SKY SERVICE: _____

180 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____ ***MASK SCRIBE B# & P# AND VERIFY*** 1. Apply Axalta 13205S Cleaner inside and outside crosstube per QSI 005 4.1.4 BATCH: _____ 2.

Axalta 230S Metalok inside and outside crosstube per QSI 005 4.1.4 BATCH: _____ 3. Prime inside and outside crosstube per QSI 005 4.2 BATCH: _____ 4. Paint outside of crosstube per QSI 005 4.2 BATCH: _____

190 - Then, Wrap in plastic bag to protect from scratches ***VERIFY BY _____ BATCH # TO MATCH W/O _____

193 - ISSUE P/O: _____ 1. Apply Axalta 13205S Cleaner inside and outside crosstube per QSI 005 4.1.4 BATCH: _____ 2. Axalta 230S Metalok inside and outside crosstube per QSI 005 4.1.4 BATCH: _____

3. Prime inside and outside crosstube per QSI 005 4.2 BATCH: _____ 4. Paint outside of crosstube per QSI 005 4.2 BATCH: _____ C OF C IS REQUIRED

200 - INSTALL GROUND WIRE INSERT, THEN INSERT SCREW AND WASHER ***LIMIT AIR PRESSURE TO 50 PSI WHEN INSTALLING AETC-1032 INSERT AND ONLY EXPAND INSERT ONCE*** 1-Abrade mating surfaces of support and crosstube with 180 grit sandpaper, clean the area with MEK or equivalent as per dwg 2-Install supports with Proseal 890 per D350-748-243 and QSI 015 A/R Proseal 890 Batch: 5096394 EXP: 3/18 3-Install supports clamps Using Dt8876 as per Dwg D350-748-243, Torque to 60-80 IN-LBS. PROSEAL CURE TIME 72 HOURS: Start: 18/11/23 Finish: 18/11/28

210 - ***RE-CHECK TORCQUE ON CLAMP AFTER PROSEAL HAS CURED FOR 72HOURS AS PER DWG.***

***VERIFY BY _____ BATCH # TO MATCH W/O _____

230 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____

240 - Identify and pack for shipping as per PPPD350-748-203 Location: _____ PPP Rev: _____

245 - Photocopy bluefile & type labels per PPPD350-748-203 CHG001

NOV 3 1938

DEC 1 1938

ea

ea

ea

DEC 3 1938

DEC 3 1938

Job BOM

Part / Item	Component Name	Quantity	Operation	Container
D350-748-243TRN	Crosstube Installation, High Aft	1 Ea (1 ea)	90-Start up Operation	
AETC-1032	Insert	1 Ea (1 ea)	200-Crosstubes	
D3502-1	Support	2 Ea (2 ea)	200-Crosstubes	
D5123-7	Clamp Cushion	2 Ea (2 ea)	200-Crosstubes	
MS21920-20	Clamp	2 Ea (2 ea)	200-Crosstubes	
NAS1149C0363R	Washer	1 Ea (1 ea)	200-Crosstubes	
MS51958-63	Screw	1 pcs (1 ea)	200-Crosstubes	
AN4-41A	Bolt	8 Ea (8 ea)	220-Packaging	5058981-1
AN4-6A	Bolt	16 Ea (16 ea)	220-Packaging	5053945
AN5-32A	Bolt	4 Ea (4 ea)	220-Packaging	50589831
D3500-1	Saddle	4 Ea (4 ea)	220-Packaging	5088731 X1 5105264X3
D3501-1	Bushing	16 Ea (16 ea)	220-Packaging	5124356
MS21042L4	Nut	24 Ea (24 ea)	220-Packaging	5109736
MS21042L5	Nut	4 Ea (4 ea)	220-Packaging	5093590
MS51958-63	Screw	1 pcs (1 ea)	220-Packaging	
NAS1149D0463J	Washer	32 Ea (32 ea)	220-Packaging	5092780
NAS1149D0563J	Washer	8 Ea (8 ea)	220-Packaging	5050003

Job Allocations

Operation	Component Part	Required	Inventory	Allocated
90-Start up Operation	D350-748-243TRN	1	2	0
200-Crosstubes	AETC-1032	1	199	0
	D3502-1	2	20	0
	D5123-7	2	283	0
	MS21920-20	2	176	0
	MS51958-63	1	57	0
	NAS1149C0363R	1	199	0
220-Packaging	AN4-41A	8	431	0
	AN4-6A	16	694	0
	AN5-32A	4	525	0
	D3500-1	4	31	0
	D3501-1	16	381	0
	MS21042L4	24	2,366	0
	MS21042L5	4	415	0
	MS51958-63	1	57	0
	NAS1149D0463J	32	4,642	0
	NAS1149D0563J	8	1,308	0

Part Specifications

Specifications could not be found.

Plex 11/22/18 11:45 AM dart.belanger.natasha



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Hawkesbury, ON
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D350-748-203
Job Sheet 181668



Part No: D350-748-203

Job Qty: 1 ea

Part Name: AS350 / AS355 Stainless Steel Aft Crosstube



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 8/3/18

Job Tracking No:

Due Date: 8/24/18

Created By: Marie Lajeunesse

Type: Stock

Description:

Note: D350-748-243 REV:A IPP REV:A 15.03.23 NEW ISSUE DD VERF;JLM

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup	Run	Workcenter / Supplier	Lead Time	
					hrs	Hrs			
90	Start up Operation	1 Ea		8/24/18	0.00	0.00	Start Up Crosstubes-1		GP 2018-11-07
110	CNC Bend Crosstubes	1 pcs		8/24/18	5.40	2.44	CNC Bend Crosstube		GP 2018-11-07
120	Crosstubes	1 pcs		8/24/18	0.00	2.19	Crosstubes-2		GP 2018-11-07
127	QC	1 pcs		8/24/18	0.00	0.00	QC15		38
128	Crosstubes	1 pcs		8/24/18	0.00	1.98	Crosstubes-2		GP 2018-11-07
130	Crosstubes	1 pcs		8/24/18	0.00	2.89	Crosstubes-2		GP 2018-11-07
140	QC	1 pcs		8/24/18	0.00	0.00	QC6		38
174	Outsource	1 pcs		8/24/18			SKY002-VC		GP 2018-11-07
176	Packaging	1 pcs		8/24/18	0.00	0.00	Packaging2		NOV 9 2018
178	QC	1 pcs		8/24/18	0.00	0.00	QC5		38
180	SprayPaint	1 pcs		8/24/18	0.00	1.07	Spray Paint		9-80
190	QC	1 pcs		8/24/18	0.00	0.00	QC14		
200	Crosstubes	1 pcs		8/24/18	0.00	2.89	Crosstubes-2		
210	QC	1 pcs		8/24/18	0.00	0.00	QC5		
220	Packaging	1 pcs		8/24/18	0.00	0.00	Packaging1-3		
230	QC	1 pcs		8/24/18	0.00	0.00	QC4		
240	Packaging	1 pcs		8/24/18	0.00	0.00	Packaging3-1		
245	DC	1 pcs		8/24/18	0.00	0.00	DC		
250	QC21-FG	1 Ea		8/24/18	0.00	0.00	QC21		

Part Op 110 - Bend tube as per Dwg D350-748-243 using CNC bender program D350A and Folio FT *****UNDER

Descriptions: BEND .225" PER SIDE*****USE (4) DT9824 SHIM BLOC TO CHECK STRAIGHTNESS*****

120 - ***VERIFY CROSSTUBE DIMENSIONS AS PER DWG***

127 - ***MARK CUT LINES***

128 - CUT TUBE AT HEIGHT ON FAI SHEET VERF HEIGHT _____ BY QC 15 LEVEL INSPECTOR _____

130 - 1- Drill Tube as per Dwg D350-748-243 Using DT8876 Drill Jigs, set-up drill table as per QSI 010. 2-Deburr 3- Engrave Part # and Batch # as per Dwg D350-748-243 4- Remove all marks from tube within limits of D350-748-243

174 - ISSUE P/O TO SKY SERVICE:

180 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____ ***MASK SCRIBE B# & P# AND VERIFY*** 1. Apply Axalta 13205S Cleaner inside and outside crosstube per QSI 005 4.1.4 BATCH: _____ 2.

Axalta 230S Metalok inside and outside crosstube per QSI 005 4.1.4 BATCH: _____ 3. Prime inside and outside crosstube per QSI 005 4.2 BATCH: _____ 4. Paint outside of crosstube per QSI 005 4.2 BATCH: _____

190 - Then, Wrap in plastic bag to protect from scratches ***VERIFY BY _____ BATCH # TO MATCH W/O

200 - INSTALL GROUND WIRE INSERT, THEN INSERT SCREW AND WASHER ***LIMIT AIR PRESSURE TO 50 PSI WHEN INSTALLING AETC-1032 INSERT AND ONLY EXPAND INSERT ONCE*** 1-Abraze mating surfaces of support

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS <table style="width: 100%; border: none;"> <tr> <td style="border: none;">Skid-tube ☐</td> <td style="border: none;">Cross tube ☐</td> <td style="border: none;">Water Jet ☐</td> <td style="border: none;">Engineering ☐</td> </tr> <tr> <td style="border: none;">Machining ☐</td> <td style="border: none;">Small Fab ☐</td> <td style="border: none;">Prod. Eng. Coord. ☐</td> <td style="border: none;">Quality ☐</td> </tr> <tr> <td style="border: none;">Thermoforming ☐</td> <td style="border: none;">Finishing ☐</td> <td style="border: none;">Rec/Store/Packaging ☐</td> <td style="border: none;">Other ☐</td> </tr> <tr> <td style="border: none;">Large Fab ☐</td> <td style="border: none;">Composite ☐</td> <td style="border: none;">Supplier ☐</td> <td></td> </tr> </table>				Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐				
Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐																					
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Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐																					
Large Fab ☐	Composite ☐	Supplier ☐																						
Date : _____	Step #: _____	QTY Effective : _____		MRB (QSI042) Approval																				
Description Work Order Deviation		Disposition		Completed By																				
Instructions: TC STC SH06 - 27 Issue 2, FA0087C SR02359NY 11/03/04, EASA S				Lead hand / Supervisor Approval Verification																				
				QC / QA Coordinator Approval																				
FAULT CATEGORY <table style="width: 100%; border: none;"> <tr> <td style="border: none;">☐ Power Loss/Surge</td> <td style="border: none;">☐ Positioned Wrong</td> </tr> <tr> <td style="border: none;">☐ Folio/Program</td> <td style="border: none;">☐ Outside Dimensions</td> </tr> <tr> <td style="border: none;">☐ Grain</td> <td style="border: none;">☐ Over/Under tolerance</td> </tr> <tr> <td style="border: none;">☐ Weld</td> <td style="border: none;">☐ Part Incorrect</td> </tr> <tr> <td style="border: none;">☐ Wrong Stock Pulled</td> <td style="border: none;">☐ Part Lost/Missing</td> </tr> <tr> <td style="border: none;">☐ Out of Sequence</td> <td style="border: none;">☐ Part Moved</td> </tr> <tr> <td style="border: none;">☐ Off-set</td> <td style="border: none;">☐ Drawing</td> </tr> <tr> <td style="border: none;">☐ Mislabeled</td> <td style="border: none;">☐ Finish</td> </tr> <tr> <td style="border: none;">☐ Fit/Function</td> <td style="border: none;">☐ Misread</td> </tr> <tr> <td style="border: none;">☐ Misaligned/off center</td> <td style="border: none;">☐ Turning Sequence</td> </tr> </table>					☐ Power Loss/Surge	☐ Positioned Wrong	☐ Folio/Program	☐ Outside Dimensions	☐ Grain	☐ Over/Under tolerance	☐ Weld	☐ Part Incorrect	☐ Wrong Stock Pulled	☐ Part Lost/Missing	☐ Out of Sequence	☐ Part Moved	☐ Off-set	☐ Drawing	☐ Mislabeled	☐ Finish	☐ Fit/Function	☐ Misread	☐ Misaligned/off center	☐ Turning Sequence
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Container No: S125376



Part: D350 - 748 - 203

Job No: 181668

Serial No/Batch: S125376

Revision: A

Inspector:

Exp Date:

and crosstube with 180 grit sandpaper, clean the area with MEK or equivalent as per dwg 2-Install supports with Proseal 890 per D350-748-243 and QSI 015 A/R Proseal 890 Batch: 5016374 EXP: 3/19 3-Install supports clamps Using Dt8876 as per Dwg D350-748-243 Torque to 60-80 IN-LBS. PROSEAL CURE TIME 72 HOURS: Start: 18/11/23 Finish: 18/11/24

210 - ***RE-CHECK TORQUE ON CLAMP AFTER PROSEAL HAS CURED FOR 72HOURS AS PER DWG.***

***VERIFY BY _____ BATCH # TO MATCH W/O _____

230 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____

240 - Identify and pack for shipping as per PPPD350-748-203 Location: _____ PPP Rev: _____

245 - Photocopy bluefile & type labels per PPPD350-748-203 CHG001

Job BOM

Part / Item	Component Name	Quantity	Operation	Container
D350-748-243TRN	Crosstube Installation, High Aft	1 Ea (1 ea)	90-Start up Operation	<u>5104185</u>
AETC-1032	Insert	1 Ea (1 ea)	200-Crosstubes	
D3502-1	Support	2 Ea (2 ea)	200-Crosstubes	
D5123-7	Clamp Cushion	2 Ea (2 ea)	200-Crosstubes	
MS21920-20	Clamp	2 Ea (2 ea)	200-Crosstubes	
NAS1149C0363R	Washer	1 Ea (1 ea)	200-Crosstubes	
MS51958-63	Screw	1 pcs (1 ea)	200-Crosstubes	
AN4-41A	Bolt	8 Ea (8 ea)	220-Packaging	
AN4-6A	Bolt	16 Ea (16 ea)	220-Packaging	
AN5-32A	Bolt	4 Ea (4 ea)	220-Packaging	
D3500-1	Saddle	4 Ea (4 ea)	220-Packaging	
D3501-1	Bushing	16 Ea (16 ea)	220-Packaging	
MS21042L4	Nut	24 Ea (24 ea)	220-Packaging	
MS21042L5	Nut	4 Ea (4 ea)	220-Packaging	
MS51958-63	Screw	1 pcs (1 ea)	220-Packaging	
NAS1149D0463J	Washer	32 Ea (32 ea)	220-Packaging	
NAS1149D0563J	Washer	8 Ea (8 ea)	220-Packaging	

Job Allocations

Operation	Component Part	Required	Inventory	Allocated
90-Start up Operation	D350-748-243TRN	1	2	0
200-Crosstubes	AETC-1032 <u>FM137335</u>	①	235	0
	D3502-1 <u>F163847</u>	②	78	0
	D5123-7 <u>163264</u>	②	345	0
	MS21920-20 <u>5034404</u>	②	140	0
	MS51958-63 <u>FM134962</u>	①	66	0
	NAS1149C0363R <u>5132615</u>	①	249	0
220-Packaging	AN4-41A	8	654	0
	AN4-6A	16	1,474	0
	AN5-32A	4	365	0
	D3500-1	4	113	0
	D3501-1	16	543	0
	MS21042L4	24	6,198	0
	MS21042L5	4	1,112	0
	MS51958-63	1	66	0
	NAS1149D0463J	32	10,335	0
	NAS1149D0563J	8	2,086	0

Part Specifications

Specifications could not be found.

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

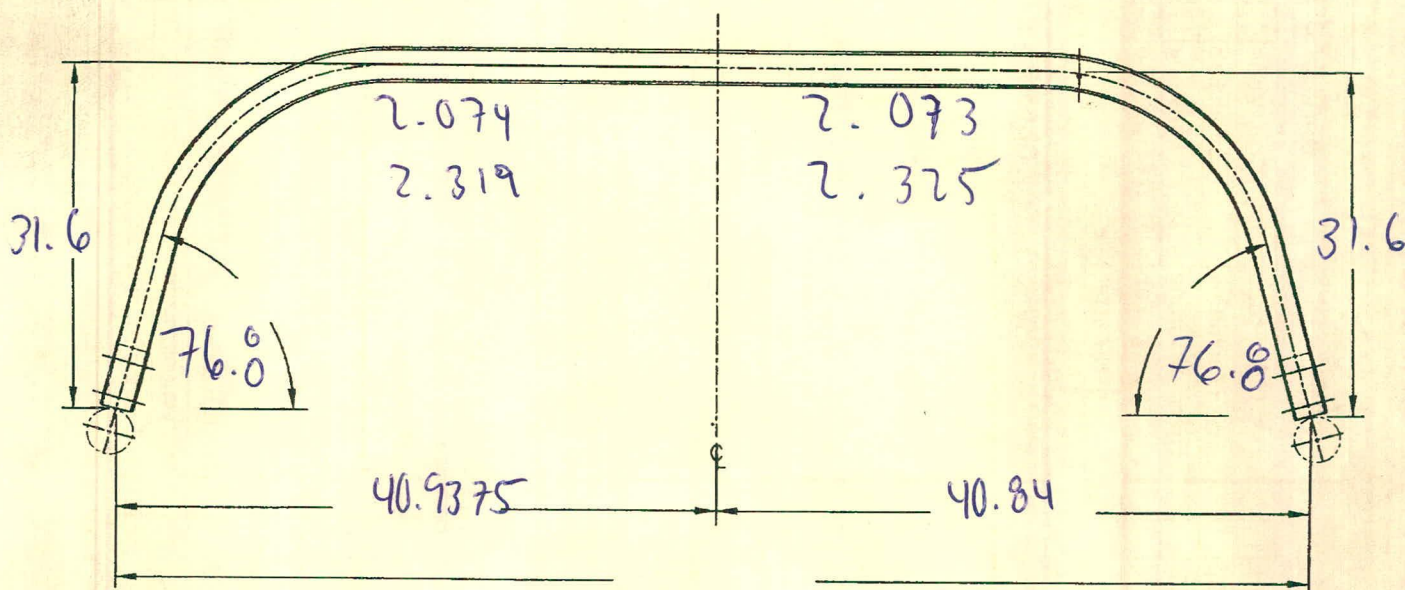
QA Closed: _____ Date: _____

Work Order update only ☐

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DART AEROSPACE LTD		Work Order:	181668
Description: Crosstube High Aft, SS (AS350/355)		Part Number:	D350-748-203
Inspection Dwg: D350-748-243	Rev: A	Page 1 of 1	

Required Dimension	Min	Max
Height	31.10	31.60
1/2 Span	40.77	41.03
Angle	75	77
Total Span	81.54	82.06
Bending Passes	7	--
Crushing	--	8%
Twist	--	0.38



	Side A	Side B
Bending Passes	32	32
Crushing	5.6%	5.7%
Comments		

QC15 Inspection	AD
Date	18-11-06

Rev	Date	Change	Revised by	Approved
A	15.09.09	New Issue	KJ	

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval		
Description Work Order Deviation				Disposition				Completed By	
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Past Expiry Date ☐	Manufacturing Process ☐								
Misidentified ☐	Past Due ☐	OTHER :							

Item	Qty -243	Part Number	Description
1	X	D350-748-243	CROSSTUBE ASSEMBLY (AS 350/355 HI AFT)
2	1	D6021-125	CROSSTUBE
3	2	D3502-1	SUPPORT
4	2	D5123-7	CLAMP CUSHION
5	1	AETC-1032	INSERT
6	2	MS21920-20 OR MS21920-21/-22	CLAMP (PER DART SPEC. M-MS21920-20/-21/-22)
7	1	NAS1149C0363R	WASHER (OR AN960C10)
8	1	NAS1635-3-8	SCREW (OR MS51958-63)
9	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6021-125
FINISHED LENGTH AFTER TURNING = 124.70±0.06 (AFTER BENDING/TRIMMING = 122.70 REF)
- 2) FINISH: PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCE: PER DART QSI 018 UNLESS OTHERWISE NOTED.
WALL THICKNESS ECCENTRICITY PER DART QSI 038 7.2
MIN. ALLOWABLE WALL IS -0.020 FROM NOMINAL
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: DART PART NUMBER "D350-748-243" AND BATCH NUMBER ON INSIDE OF CUFF
PER DART QSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 29.85 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.290 HOLE.
- 9) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.

TURNING

- 10) BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER BENDING.

BENDING

- 11) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES PER SIDE. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D. ON TOP HALF OF BEND, AND 8% ON BOTTOM HALF OF BEND.
- 12) MAX AMPLITUDE OF RIPPLING ALONG BENT PORTION OF THE TUBE IS 0.030 (ZN A1-3)
- 13) MAX TWIST: WITH XTUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.38 (ZN C1-3).

ASSEMBLY

- 14) TO INSTALL D3502-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.02" TO 0.05" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

SHOP COPY
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SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER

NO. 181668 M.C.S.
18-08-03

DEO ATTACHED

RELEASED

2015 MAR 18

RELEASED

2015 MAR 18

UNDER REVIEW

15/4/15
LRF 15/5/15

A	NEW ISSUE	CP	15.01.21
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	15.01.21		

DART AEROSPACE LTD
HAWKESBURY, ONTARIO, CANADA

DRAWING NO. D350-748-243
TITLE CROSSTUBE (AS 350/355 HI AFT)

REV. A
SHEET 1 OF 4
SCALE
NTS

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DQA: _____ Date: _____



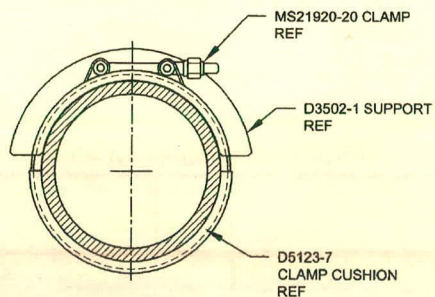
WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
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		OTHER : ☐							

**D350-748-243
ASSEMBLY DETAIL**



SECTION A-A D4-2
SCALE 6X

INSTALL THIS SIDE ONLY, AFTER FINISH:
AETC-1032 INSERT
NAS1149C0363R WASHER
NAS1635-3-8 SCREW

14 15
D3502-1 SUPPORT
MS21920-20 CLAMP (OR -21/-22)
D5123-7 RUBBER CUSHION
2 PL

D350-748-243
BENT TUBE

DEO ATTACHED

RELEASED

2015 MAR 18

UNDER REVIEW

15/4/22
9/16/29

DESIGN	9P	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	9P	DRAWING NO.	REV. A
CHECKED	A.P.	D350-748-243	SHEET 2 OF 4
MFG. APPR.	7/4/22	TITLE	SCALE
APPROVED	7/4/22	CROSSTUBE (AS 350/355 HI AFT)	NTS
DE APPR.	7/4/22	COPYRIGHT © 2015 BY DART AEROSPACE LTD	
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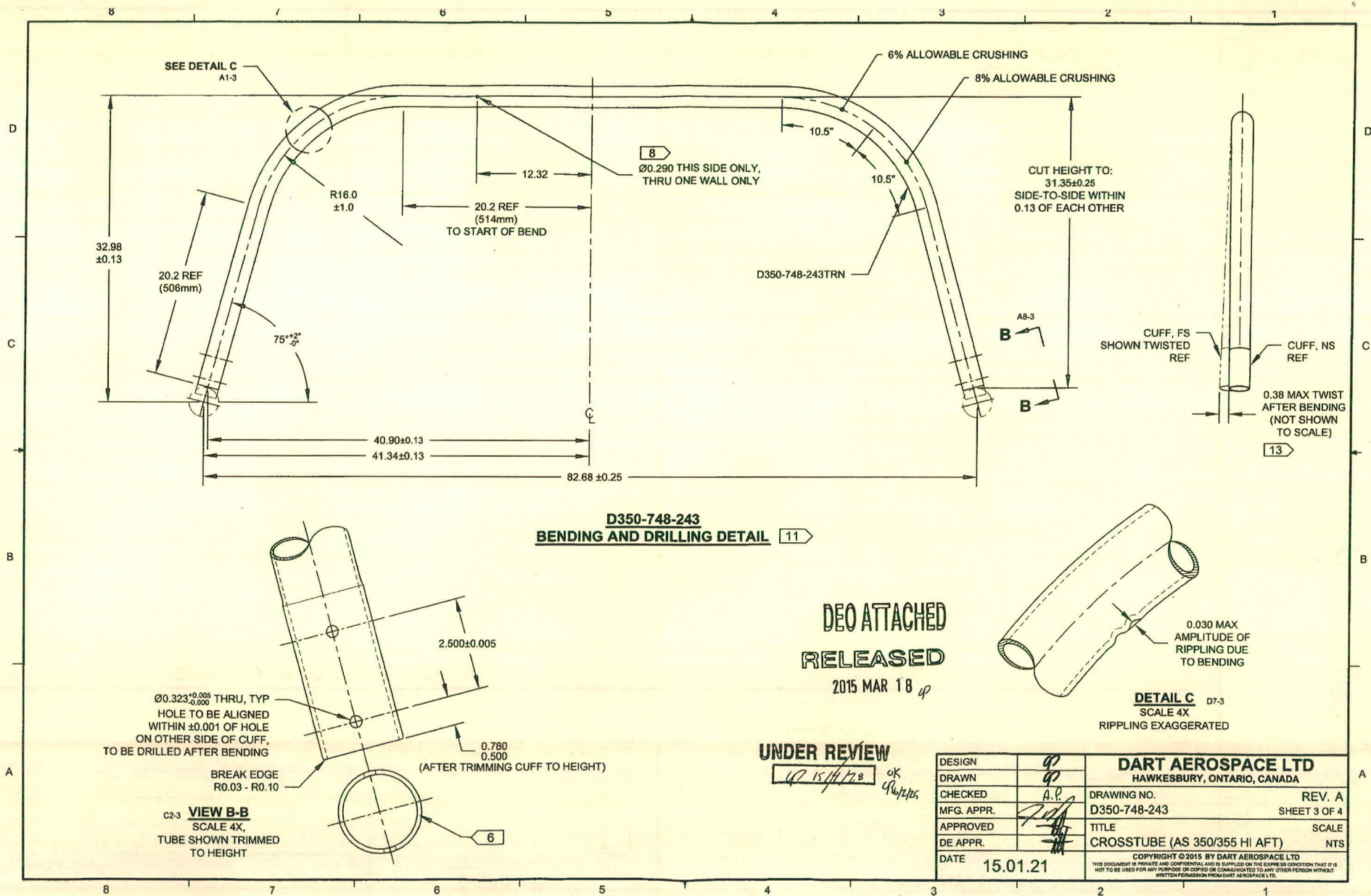


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OTHER : _____									



D350-748-243
BENDING AND DRILLING DETAIL 11

DEO ATTACHED
 RELEASED
 2015 MAR 18

UNDER REVIEW
 15/11/18 OK 9/12/18

DESIGN	9	DART AEROSPACE LTD	
DRAWN	9	HAWKESBURY, ONTARIO, CANADA	
CHECKED	A.P.	DRAWING NO.	REV. A
MFG. APPR.	9	D350-748-243	SHEET 3 OF 4
APPROVED	9	TITLE	SCALE
DE APPR.	9	CROSSTUBE (AS 350/355 HI AFT)	NTS
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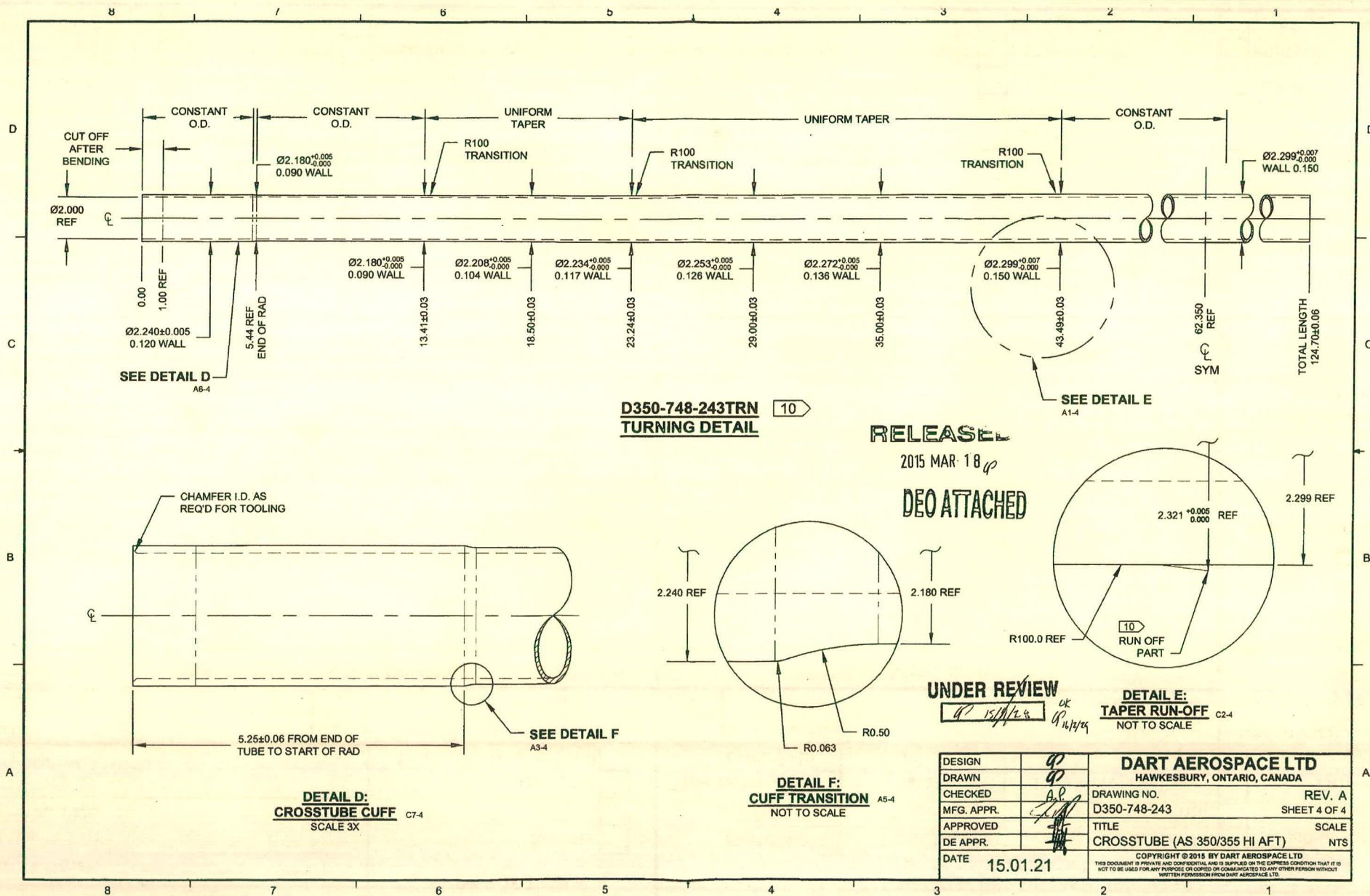


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								Lead hand / Supervisor Approval Verification	
Root Cause		FAULT CATEGORY							
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐				
Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐				
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐				
Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐				
Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐				
Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐				
Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐				
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐				
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐				
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐				
Past Expiry Date ☐	Manufacturing Process ☐								
Misidentified ☐	Past Due ☐	OTHER :							

DRAWING NO. D350-748-243	TITLE CROSSTUBE	REV. A	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D350-748-243-A-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>q</i>	CHECKED <i>ASS</i>	MFG. APPR. <i>[Signature]</i>	APPROVED <i>[Signature]</i>		DE APPR. <i>[Signature]</i>		
DATE 15.11.18	DATE 15.11.18	DATE 16.02.19	DATE FEB 19 2016		DATE 2016.02.19		

AMEND NOTE 2 (SHEET 1) AS FOLLOWS:

- 2) FINISH: PREPARE SURFACE PER DART QSI 005 4.1.4
 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
 PAINT OUTSIDE PER DART QSI 005 4.2
 OR
 POWDER COAT WHITE (4.3.5.2) PER DART QSI 005 4.3

RELEASED
 2016-02-26
EN 16-534 *[Signature]*

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 NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT
 WRITTEN PERMISSION FROM DART AEROSPACE LTD.

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval		
Description Work Order Deviation				Disposition				Completed By	
								Lead hand / Supervisor Approval Verification	
								QC / QA Coordinator Approval	
Root Cause		FAULT CATEGORY							
Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐				
Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐				
Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐				
Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐				
Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐				
Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐				
Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐				
Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐				
LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐				
Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐				
Past Expiry Date ☐	Manufacturing Process ☐	OTHER : _____							
Misidentified ☐	Past Due ☐								



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER **PO041680**

Supplier: SKY002-VC
Skyservice
6120 Midfield Road
Mississauga
ON
L5P 1B1 Canada
Phone: 905-678-5636
Fax: 905-678-5841

PO No: PO041680
PO Date: 11/12/18
Due Date: 11/20/18
Purchase Order
Revision:
Revision Date:
Ship-To Contact: Tsimiklis, Chrisoula
Phone:

Ship To: 1270 Aberdeen Street
Hawkesbury
ON
K6A 1K7 Canada
Phone: 613-632-5200

Via: Ground
Pymt Terms: Net 30
Freight Terms:
Special Comments: Please confirm pricing, and delivery to
ctsimiklis@dartaero.com

Items

Line Item	Job	Part	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
1	181671	D350-748-203	AS350 / AS355 Stainless Steel Aft Crosstube : TC STC SH06-27 Issue 2, FAA STC SR02359NY 11/03/04, EASA STC EASA.10016903 Revision 2 10/09/03, BRAZIL 2009S04-04 09/04/06 ISSUE P/O TO SKY SERVICE:	Firmed	-	11/20/18	1 pcs	0 pcs	1 pcs	\$182.14285/pcs	\$182.14
	181668		NOV 19 2018	Firmed	-	11/20/18	1 pcs	0 pcs	1 pcs	\$182.14285/pcs	\$182.14
Sub Total:							2	0	2		\$364.29
2	184649	D212-664-101	Fwd Crosstube - High : TC STC SH01-9 Issue 3, FAA STC SR01298NY 09/01/08, EASA STC EASA.IM.R.S.01304 07/03/06, DGAC MEXICO STC IA-316/2015 15/06/17 *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Liquid Penetrant Inspection as per QSI 038 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order	Firmed	-	11/20/18	1 pcs	0 pcs	1 pcs	\$182.14285/pcs	\$182.14
	184650		NOV 19 2018	Firmed	-	11/20/18	1 pcs	0 pcs	1 pcs	\$182.14285/pcs	\$182.14
	184696		NOV 19 2018	Firmed	-	11/20/18	1 pcs	0 pcs	1 pcs	\$182.14285/pcs	\$182.14
Sub Total:							3	0	3		\$546.43

DAS
38
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08-0



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER **PO041680**

Items

Line Item	Job	Part	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
3	185756	D350-748-103	AS350 / AS355 Stainless Steel Fwd Crosstube : TC STC SH06-27 Issue 2, FAA STC SR02359NY 11/03/04, EASA STC EASA.10016903 Revision 2 10/09/03, BRAZIL 2009S04-04 09/04/06 ISSUE P/O TO SKY SERVICE: _____	Firmed	-	11/20/18	1 pcs	0 pcs	1 pcs	\$182.14285/pcs	\$182.14
4	184242	D4464-041	Fuel Tank Assembly : Various STC's ISSUE P/O : _____ LIQUID PENETRANT INSPECTION AS PER QSI 038 OR LPI AS PER ASTM 1417 LEVEL 2	Firmed	-	11/20/18	1 pcs	0 pcs	1 pcs	\$182.14285/pcs	\$182.14
Grand Total:										\$1,275.00	

Order Notes

Procurement Quality Clauses

A005 right of entry
A012 chemical and physical test report
A016 personnel qualification
A017 raw material identification (as applicable)

A022 Apical Processing
A024 process certifications
A026 certification of material conformance

A041 quality management system
A042 dart notification by supplier
A043 retension of quality documents

A048 counterfeit parts avoidance, detection, mitigation and disposition program

A049 supplier awareness

Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit www.dartaerospace.com for further explanation.

Plex 11/12/18 4:02 PM dart.tsimiklis.chrisoula

**skyservice****Work Order Traveler**

Sky Service F.B.O. Inc.

10105 Ryan Avenue, Dorval, Quebec, H9P 1A2

TCCA AMO 53-89 / EASA 145.7142 / BDA AMO 385

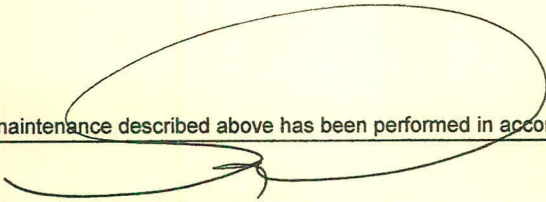
WO #: MWO38124	Customer: Dart Aerospace Ltd.	Dept: NDT YUL	Reference: P6041680
Descr:	PN:	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN:	CSN:	TSO:	
Task: UNSCHEDULED			Sequence: 1

Work Required:**CARRY OUT NDT ON:**

- 1 FUEL TANK ASSY, P/N# D4464-041, J/S# 184242 ✓
- 3 FWD CROSSTUBES, P/N# D212-664-101, J/S# 184649, 184650, 184696 ✓
- 1 FWD CROSSTUBE, P/N# D350-748-103, J/S# 185756 ✓
- 2 AFT CROSSTUBES, P/N# D350-748-203, J/S# 181671, 181668 ✓

Action Taken:						Date:	Initial/Stamp
LPI C/O IAW ASTM E-1417 REV. 16						NOV 12 2018	 DOT-APP 20 53-89
NO CRACK OR LEAK FOUND							
PEN. ZL-56, MPO13600, CLEANER SKC-S MPO13923, DEV. MPO11715, UV LIGHT M-20142							
Description	Location	P/N	Qty	Batch	S/N Off	S/N On	

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature: 	ACA/SCA Stamp DOT-APP 20 53-89	Date: NOV 12 2018
Name: RAFIK MELIKIAN		



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER
PO041772

Supplier: ATE003-VC
Atelier Debosselage
358 Principale
Calumet
QC
J0V 1B0 Canada
Phone: 819 242 5633

PO No:	PO041772
PO Date:	11/19/18
Due Date:	11/22/18
Purchase Order	
Revision:	
Revision Date:	
Ship-To Contact:	Tsimiklis, ChrisoulaPhone:

Ship To: 1270 Aberdeen Street
Hawkesbury
ON
K6A 1K7 Canada
Phone: 613-632-5200

Via:	Ground
Pymt Terms:	Net 30
Freight Terms:	
Special Comments:	

Items

Line Item	Job	Part	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
1	181671	D350-748-203	AS350 / AS355 Stainless Steel Aft Crosstube : TC STC SH06-27 Issue 2, FAA STC SR02359NY 11/03/04, EASA STC EASA.10016903 Revision 2 10/09/03, BRAZIL 2009S04-04 09/04/06 ISSUE P/O: _____ 1. Apply Axalta 13205S Cleaner inside and outside crosstube per QSI 005 4.1.4 BATCH: _____ 2. Axalta 230S Metalok inside and outside crosstube per QSI 005 4.1.4 BATCH: _____ 3. Prime inside and outside crosstube per QSI 005 4.2 BATCH: _____ 4. Paint outside of crosstube per QSI 005 4.2 BATCH: _____ C OF C IS REQUIRED	Firmed	-	11/22/18	1 pcs	0 pcs	1 pcs	\$225.00/pcs	\$225.00
	181668			Firmed	-	11/22/18	1 pcs	0 pcs	1 pcs	\$225.00/pcs	\$225.00
Sub Total:							2	0	2		\$450.00



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER

PO041772

Items											
Line Item	Job	Part	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
2	185756	D350-748-103	AS350 / AS355 Stainless Steel Fwd Crosstube : TC STC SH06-27 Issue 2, FAA STC SR02359NY 11/03/04, EASA STC EASA.10016903 Revision 2 10/09/03, BRAZIL 2009S04-04 09/04/06 ISSUE P/O: _____ 1. Apply Axalta 13205S Cleaner inside and outside crosstube per QSI 005 4.1.4 BATCH: _____ 2. Axalta 230S Metalok inside and outside crosstube per QSI 005 4.1.4 BATCH: _____ 3. Prime inside and outside crosstube per QSI 005 4.2 BATCH: _____ 4. Paint outside of crosstube per QSI 005 4.2 BATCH: _____ C OF C IS REQUIRED	Firmed	-	11/22/18	1 pcs	0 pcs	1 pcs	\$225.00/pcs	\$225.00
Grand Total:										\$675.00	

Order Notes

Procurement Quality Clauses
A005 right of entry
A012 chemical and physical test report
A016 personnel qualification
A017 raw material identification (as applicable)

A022 Apical Processing
A024 process certifications
A026 certification of material conformance

A041 quality management system
A042 dart notification by supplier
A043 retention of quality documents

A048 counterfeit parts avoidance, detection, mitigation and disposition program

A049 supplier awareness

Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit www.dartaerospace.com for further explanation.

Plex 11/19/18 1:53 PM dart.tsimiklis.chrisoula

Change Record

PAGE 1 OF 1

Part Number: D350-748-203

Description: CROSSTUBE HIGH AFT, STAINLESS STEEL

[illegible]

